

Appln No.: 10/062,700
Amdt dated: November 28, 2005
Reply to Final Rejection of July 27, 2005

Remarks

Claims 1 to 26 remain in the application.

The present invention concerns methods and apparatus used to determine the physical connectivity configuration of the nodes in a communications network assuming that the physical connectivity configuration of at least a portion of the network is unknown. The claimed methods discover the connectivity of a network without knowledge of the topology (physical connectivity configuration) of the nodes (ATM switches, Frame Relay switches, Routers, etc.)

The independent claims pending the present application, claims 1, 13, 25 and 26, have been amended to recite the limitation that the physical connectivity configuration of at least a portion of the network is unknown. Accordingly, dependent claims 2 to 12 and 14 to 24 contain the same limitation.

Contrariwise, U.S. Patent Application No. 2002/0001307 (Nguyen) provides a method for improving the integrity of virtual connections. Nguyen, in all cases, assumes that the connectivity of the network is known to at least one network entity, either a management entity or a network switching entity. Other network entities receive the connectivity information they need from the entities that have the information. Nguyen does not provide a method for determining network physical connectivity configuration when the physical connectivity configuration is not known to any management element or to any network entity.

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The methods and apparatus of the present patent application are different from those of Nguyen. While data collection procedures are described in both the present patent application and in Nguyen, the use to which the collected data is applied is different. Data collection per se is known in the art of network management. Applicants' claimed methods use their collected data to determine the physical connectivity configuration of nodes in a communications network where the topology (physical connectivity configuration) of the nodes is unknown. Nguyen uses their collected data to improve the integrity of virtual connections, where the connectivity of the network is known to at least one virtual entity. Therefore, it is respectfully submitted that the Examiner's comments in paragraph 3 of the Office Action have been addressed.

Claims 1 to 26 stand rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Application No. 2002/0001307 to Nguyen et al. As noted above, all of the claims have been amended to recite the limitation that the physical connectivity configuration of at least a portion of the network is unknown. Nguyen et al assumes that the connectivity of the network is known to at least one network entity, either a management entity or a network switching entity. Therefore, it is respectfully submitted that claims 1 to 26 in the present application are not anticipated within the four corners of the Nguyen et al reference and hence, should be deemed allowable.

Claims 1 and 25 claim a method of determining a physical connectivity configuration of at least a portion of the network when the existence of the link is

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unknown. Claims 13 and 26 claim an apparatus for determining a physical connectivity configuration of at least a portion of the network when the existence of the link is unknown.

In the paragraphs cited by the Examiner (0639, 0620, 0621, and 0616) Nguyen et al fails to teach or even suggest how to identify a link when the existence of the link is unknown. The paragraphs refer to the transfer of known connection information from one network element to another, which is data collection. Therefore, it is respectfully submitted that Claims 1, 13, 25 and 26 should be deemed allowable over Nguyen et al.

Claims 2 and 14 claim, inter alia, receiving management information base parameters from the nodes. This is data collection which is organized for use in determining physical connectivity of the nodes in a communications network where it is assumed that the physical connectivity is unknown. Nguyen et al collects data to improve the integrity of virtual connections where the connectivity of the network is known to at least one network entity.

Claims 3 and 15 claim receiving virtual path identifier information (VPI) for each virtual connection. In paragraph 218, Nguyen describes how a network administrator can use the software in Nguyen et al to establish a new virtual connection in a network using previously collected VPI and VCI data. This is different from receiving the VPI as a part

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of a method to determine a physical connectivity configuration of at least a portion of a network when the network connectivity configuration is unknown.

Claims 4 and 16 claim receiving virtual channel identifier (VCI) information for each virtual connection. In paragraph 218, Nguyen et al describes how a network administrator can use the software in Nguyen et al to establish a new virtual connection in a network using previously collected VPI and VCI data. This is different from the claimed receiving the VCI as a part of a method to determine a physical connectivity configuration of at least a portion of a network when the network physical connectivity configuration is unknown.

Claims 5 and 17 claim determining one or more identifiers for each of the one or more virtual connections. Paragraph 0218 is discussed above. Paragraph 0219 describes how a network administrator can use the software in Nyugen et al to establish a new virtual path connection in a network using previously collected VPI data. Nyugen et al fails to teach or suggest determining a portion of a network physical connectivity configuration when the physical connectivity configuration is unknown by determining one or more identifiers for each of the one or more virtual connections.

Claims 6 and 18 claim determining at least one link between the subset of the nodes comprising determining the subset of nodes having the same one or more identifiers. Paragraph 0220 of Nyugen et al describes how a network administrator can

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use the Nyugen et al software to find available VPI and VCI for new connections. The paragraph does not describe how to establish that there is a link between two network elements when the existence of the link is unknown. Claims 6 and 8 are a part of a method for identifying unknown links between network elements.

Claims 7 and 19 claim determining one or more identifiers comprising determining a virtual path identifier for each of the one or more virtual connections. In paragraph 218, Nguyen et al describes how a network administrator can use the software in Nguyen et al to establish a new virtual connection in a network using previously collected VPI and VCI data. This is different from receiving the VPI as a part of a method to determine a physical connectivity configuration of at least a portion of a network when the network physical connectivity configuration is unknown.

Claims 8 and 20 claim determining one or more identifiers comprising determining a virtual channel identifier for each of the one or more virtual connections. In paragraph 218, Nguyen et al describes how a network administrator can use the software in Nguyen et al to establish a new virtual connection in a network using previously collected VPI and VCI data. This is different from receiving the VPI and VCI as a part of a method to determine a physical connectivity configuration of at least a portion of a network when the network physical connectivity configuration is unknown.

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Claims 9 and 21 are dependent upon Claim 1 and claim that the determining respective labels comprises determining a number of the virtual connections traversing the nodes and determining respective cardinalities of the nodes based on the number of virtual connections. Paragraph 0220 describes how a network administrator can use the Nguyen et al software to find available VPI and VCI for new connections. It does not describe how to establish that there is a link between two network elements when the existence of the link is unknown. Claims 9 and 21 are a part of a method for identifying unknown links between network elements.

Claims 10 and 22 claim determining the subset of nodes having the same cardinality. Paragraph 0616 describes how an external network is connected to a network element of the Nguyen et al patent application. This is a new link, but it is a known link; as are all links between network elements in the Nguyen patent application. Claims 10 and 22 are part of a method for identifying unknown links between network elements.

Claims 11 and 23 claim receiving additional status information when the subset of nodes exceeds a threshold number of nodes. The threshold rules described in paragraph 0882, and other paragraphs describing threshold rules, apply to network monitoring using software of the Nguyen et al patent application. These Nguyen et al threshold rules are not used for identifying unknown connections. Claims 11 and 23 are an element of a method and apparatus for identifying unknown links between network elements.

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Claims 12 and 24 claim that the number of nodes is 2. The threshold rules described in paragraph 0887, and other paragraphs describing threshold rules, apply to network monitoring using software of the Nguyen et al patent application. The Nguyen et al threshold rules are not used for identifying unknown connections. Claims 12 and 24 claim an element of a method and apparatus for identifying unknown links between network elements.

It is respectfully submitted that for the reasons set forth above Claims 1 to 26, as amended to recite the limitation that the physical connectivity configuration of at least a portion of the network is unknown, in the present application should be deemed allowable over the art of record.

Entry of this amendment is respectfully requested since the claims have been amended consonant with the Examiner's comment regarding a limitation argued in the prior amendment not being specifically recited in the claims. This amendment responds to the Examiner's comment. In addition, this amendment places the claims in better condition for consideration on appeal.

Reexamination, reconsideration and allowance of Claims 1 to 26 as currently amended are respectfully solicited.

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The Patent and Trademark Office is hereby authorized to charge Deposit Account No. 02-1822 the fee due under 37 CFR 1.17(a) of \$120.00 for a one month extension of the time to reply to the Office Action.

Respectfully submitted,



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